

What is claimed is:

1. A data transmission method for information data containing additional information data therewith, comprising, at a transmitter side, following steps:

5 a first step for adding error correction codes for correcting error to said additional information data;

a second step for embedding said additional information data added with said error correction codes into the information data by plural times, repetitively;

10 and

a third step for transmitting the information data embedded with the repetitive additional information data therein.

2. A data transmission method for the information data transmitted through the method as claimed in Claim 1, comprising, at a receiver side, following steps:

a fourth step for receiving the transmitted information data embedded with the repetitive additional information data therein;

20 a fifth step for detecting the repetitive additional information data embedded from said transmitted information data received in the fourth step;

a sixth step for determining said additional information data on a basis of a majority rule when receiving said information data; and

25 a seventh step for correcting error with using the error correction codes received and determined when said

additional information data contains error(s) therein.

3. A data transmission method as claimed in Claim 1 or 2, wherein said information data includes at least one of video data, audio data and text data.

5 4. A data transmission method for information data containing additional information data therewith, comprising, at a transmitter side, following steps:

a first step for encoding said additional information data in accordance with a predetermined conversion table;

10 a second step for embedding said additional information data encoded in the above step into the information data by plural times, repetitively; and

15 a third step for transmitting the information data embedded with the repetitive additional encoded data therein.

5. A data transmission method for the information data transmitted through the method as claimed in Claim 4, comprising, at a receiver side, following steps:

20 a fourth step for receiving the transmitted information data embedded with the repetitive additional information data encoded;

a fifth step for detecting the repetitive additional information data encoded, which are embedded within the information data received;

25 a sixth step for determining said encoded additional information data on a basis of a majority rule of the repetitive encoded additional information data detected;

and

a seventh step for decoding the encoded data into the additional information data.

6. A data transmission method as claimed in Claim 4 or 5, wherein said information data includes at least one of video data, audio data and text data.

7. A data transmission method for information data containing additional information data therewith, comprising, at a transmitter side, following steps:

10 a step for preparing data frames of said information data into which the additional information data are to be embedded;

15 a step for altering at least part of the data frame in accordance with predetermined patterns corresponding to the additional information data to be embedded, for the plural continuous frames, repetitively; and

a step for transmitting the information data embedded with the repetitive additional information data therein.

20 8. A data transmission method for the information data transmitted through the method as claimed in Claim 7, comprising, at a receiver side, following steps:

25 a step for receiving the transmitted information data embedded with the repetitive additional information data therein;

a step for detecting the repetitive additional information data embedded from said transmitted

information data; and

a step for determining said additional information data on a basis of continuity of the repetitive additional information data detected for a predetermined times.

5 9. A data transmission method as claimed in Claim 7 or 8, wherein said information data includes at least one of video data, audio data and text data.

10 10. A data transmitting apparatus for transmitting information data containing additional information data therewith, comprising:

a first means for adding error correction codes for correcting error to said additional information data;

15 a second means for embedding the additional information data added with the error correction codes by said first means into the information data by plural times, repetitively; and

a third means for transmitting the information data embedded with the repetitive additional information data therein.

20 11. A data transmitting apparatus as claimed in Claim 10, wherein said third means includes means for recording the information data embedded with the repetitive additional information data onto an optical information recording medium.

25 12. A data reproducing apparatus for reproducing the transmitted information data transmitted by the data transmitting apparatus defined in Claim 10, comprising:

a first means for receiving the transmitted information data embedded with the repetitive additional information data therein;

5 a second means for detecting the additional information data embedded from the transmitted information data received by said first means;

a third means for determining said additional information data on a basis of a majority rule when receiving said information data; and

10 a fourth means for correcting error with using the error correction codes received and determined when said additional information data contains error(s) therein.

13. A data transmitting apparatus for transmitting information data containing additional information data therewith, comprising:
15

a first means for encoding said additional information data in accordance with a predetermined conversion table;

20 a second means for embedding said additional information data encoded in the first means into the information data by plural times, repetitively; and

a third means for transmitting the information data embedded with the repetitive additional encoded data therein.

25 14. A data transmitting apparatus as claimed in Claim 13, wherein said third means includes means for recording the information data embedded with the

repetitive additional information data onto an optical information recording medium.

15. A data reproducing apparatus for reproducing the transmitted information data transmitted by the data transmitting apparatus defined in Claim 13, comprising:

a first means for receiving the transmitted information data embedded with the repetitive additional information data encoded;

10 a second means for detecting the repetitive additional information data encoded which are embedded within the information data received;

15 a third means for determining said encoded additional information data on a basis of a majority rule of the repetitive encoded additional information data detected; and

a fourth means for decoding the encoded data into the additional information data.

16. A data transmitting apparatus for transmitting information data containing additional information data therewith, comprising:

a first means for preparing data frames of said information data into which the additional information data are embedded;

25 a second means for altering at least part of the data frame in accordance with predetermined patterns corresponding to additional information data to be embedded, for the plural continuous frames, repetitively;

and

a third means for transmitting the information data embedded with the repetitive additional information data therein.

5 17. A data transmitting apparatus as claimed in Claim 16, wherein said third means includes means for recording the information data embedded with the repetitive additional information data onto an optical information recording medium.

10 18. A data reproducing apparatus for reproducing the transmitted information data transmitted by the data transmitting apparatus defined in Claim 16, comprising:

15 a first means for receiving the transmitted information data embedded with the repetitive additional information data therein;

a second means for detecting the repetitive additional information data embedded from said transmitted information data; and

20 a third means for determining said additional information data on a basis of continuity of the repetitive additional data detected for a predetermined times.

19. An information recording medium for recording data therein, comprising:

25 information data being reproducible;

additional information data which are embedded into said information data repetitively; and

error correction codes which are added to said additional information data and also embedded into said information data repetitively.

20. An information recording medium as claimed in
5 Claim 19, wherein an information, relating to a repetition number of the additional information data embedded into said information data, is recorded into a part of said information recording medium.

0598030 10704
T020T 0500050